

INSTALLATION GUIDE

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WARRANTY

This product is covered by a warranty against material and manufacturing defects for a 24 months period from the manufacturing date.

The warranty does not cover the defects that are due to:

- Negligent and improper use
- Failures caused by atmospheric hazards
- Acts of vandalism
- Wear out of materials
- Firmware upgrades

Akse reserves the right, at its discretion, to repair or substitute the faulty products

The warranty is not applicable to the products that will result defective in consequence of a negligent and improper use or an operating procedure not contemplated in this manual.

RETURN AND REPAIR FORMALITIES

Akse accepts the return of instruments for repair only when authorized in advance. The transport costs are at customer charge.

RE-SHIPING OF REPAIRED PRODUCT

The terms for re-shipment of repaired products are ex-works, i.e. the transport costs are at customer charge.

Products returned as detective but found to be perfectly working by our laboratories, will be charged a flat fee to account for checking and testing time irrespective of the warranty terms.

SAFETY

This instrument was manufactured and tested in compliance with IEC 61010-1 CAT III - 300V class 2 standards for operating voltages up to 300 VAC rms phase to neutral.

In order to maintain this condition and to ensure safe operation, the user must comply with the indications and markings contained in the following instructions:

- When the instrument is received, before starting its installation, check that it is intact and no damage occurred during transport.
- Before mounting, ensure that the instrument operating voltages and the mains voltage are compatible then proceed with the installation.
- The instrument power supply needs no earth connection.
- The instrument is not equipped with a power supply fuse; a suitable external protection fuse must be foreseen by the contractor.
- Maintenance and/or repair must be carried out only by qualified, authorized personnel
- If there is ever the suspicion that safe operation is no longer possible, the instrument must be taken out of service and precautions taken against its accidental use.



Operation is no longer safe when:

- There is clearly visible damaged.
- The instrument no longer functions.
- After lengthy storage in unfavorable conditions.
- After serious damage occurred during transport

The instruments must be installed in respect of all the local regulations.

OPERATOR SAFETY

Warning: Failure to observe the following instructions may lead to a serious danger of death.

- During normal operation dangerous voltages can occur on instrument terminals and on voltage and current transformers. Energized voltage and current transformers may generate lethal voltages. Follow carefully the standard safety precautions while carrying out any installation or service operation.
- The terminals of the instrument must not be accessible by the user after the installation. The user should only be allowed to access the instrument front panel where the display is located.
- Do not use the digital outputs for protection functions nor for power limitation functions. The instrument is suitable only for secondary protection functions.
- The instrument must be protected by a breaking device capable of interrupting both the power supply and the measurement terminals. It must be easily reachable by the operator and well identified as instrument cut-off device.
- The instrument and its connections must be carefully protected against short-circuit.

Precautions: Failure to respect the following instructions may irreversibly damage to the instrument.

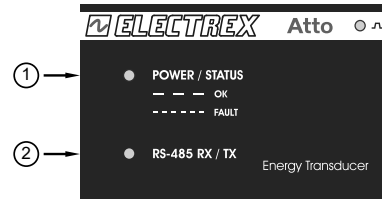
- The outputs and the options operate at low voltage level; they cannot be powered by any unspecified external voltage.
- The application of currents not compatible with the current inputs levels will damage to the instrument.

Further documentation may be downloaded from our web site www.electrex.it.

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DECLARATION OF CONFORMITY

Akse hereby declares that its range of products complies with the following directives EMC 2014/30/EU, 2014/35/EU and complies with the following product's standard CEI EN 61326 - Ed. 2.0 (2012) – IEC 61326 - Ed. 2.0 (2012), CEI EN 61010- Ed. 3 (2010) – IEC 61010- Ed. 3 (2010). The product has been tested in the typical wiring configuration and with peripherals conforming to the EMC directive and the LV directive.



LED (1)	A green LED pulses indicating the operation of the instrument
LED (2)	Two LEDs pulsate indicating the communication activity of the RS485 port (red TX LED, green RX LED)

MECHANICAL CHARACTERISTICS	
Case	Self-extinguishing plastic material class V0
Protection degree	IP40 on front panel
Size	70 x 90 x 58 mm (4 DIN modules)
VOLTAGE INPUTS	
Direct	Up to 300 Vrms phase-neutral or 519 Vrms phase to phase
	Overload: 900 Vrms phase to phase for 1 sec
Power supply	230/240Vac +/- 10% 50/60Hz
Self consumption	< 2,5VA

MODELS	
PFA74D1-D2-B	ATTO RCM D4 ECT RS485 230+240V 2DI 2DO 4COMMON TRANSDUCER / ANALYZER

SETUP SEQUENCE

PARAMETERS	VALUES AVAILABLE	DEFAULT
RS-485		
ADDR (485 address)	1 ... 247	27
COM (Baud rate)	2400, 4800, 9600, 19200, 38400	38400
COM (Data Bit)	7 or 8	8
COM (Parity)	N = no parity, E = even parity, O = odd parity	N
COM (Stop bit)	1 or 2	2
S.T. (Silent Time)	0 ... 1000 mS (Step of 10)	100
NETWORK		
IMAX	5 ... 16 A / 5 ... 16 mA	5/.005
CUTOFF (Current)	0 ... 16	0
DIFFERENTIAL		
RCD ENABLING	CH 1, 2, 3	CH 1
INTERVENTION THRESHOLD	0 ... X mA	30 mA
PRE-ALARM THRESHOLD	0 ... X mA	30 mA
INTERVENTION TIME	0 ... 5000 mS	0
PRE-ALARM TIME	0 ... 5000 mS	0
PRE-ALARM HYSTERESIS	0 ... 100 %	5 %

INPUTS - OUTPUTS

SETUP SEQUENCE

PARAMETERS	VALUES AVAILABLE	DEFAULT
DIGITAL OUT 1		
POLARITY (<i>note A</i>)	N.O.,N.C.	N.O.
DIGITAL OUT 2 (<i>see DIGITAL OUT 1</i>)		

NOTE: A

N.O.	Normally open
N.C.	Normally closed

OUTPUTS			INPUTS		
10	C1	Common 1 (negative)	19	C2	Common 2 (negative)
11	O1	Differential intervention	20	I2	Function test
12	C2	Common 2 (negative)	21	C1	Common 1 (negative)
13	O2	Pre-alarm intervention	22	I1	Differential intervention reset

OUTPUTS		INPUTS	
Maximum applicable voltage:	27 Vdc	Supply voltage (external):	from 10 to 30 Vdc
Maximum switchable current:	27mA	Current consumption:	from 2 to 10mA
		Max. count frequency	10 or 100Hz
N.B. Digital outputs (Optocoupled NPN transistor type for DIN 43864).		N.B. For gas meters a galvanic separation is needed per ATEX standards	

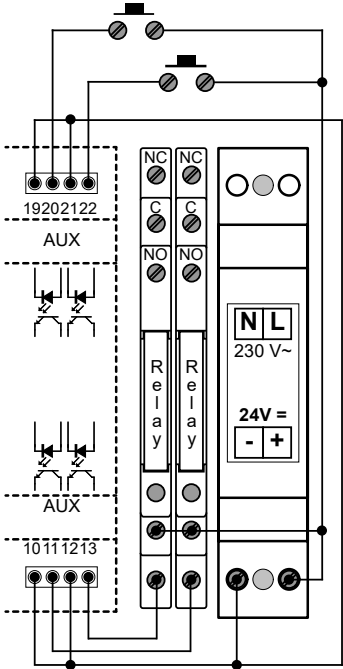


TABLE n.1 - Eg. Modbus registers reading parameters, for the complete list refer to the instrument's protocol)

INPUT REGISTERS			
REGISTER	DESCRIPTION	TYPE	UNIT
30219	Frequency of U1N (f)	Float IEEE754	[Hz]
30221	Phase to Neutral Voltage, RMS Amplitude (U1N)	Float IEEE754	[V]
30223	Phase to Neutral Voltage, RMS Amplitude (U2N)	Float IEEE754	[V]
30225	Phase to Neutral Voltage, RMS Amplitude (U3N)	Float IEEE754	[V]
30233	Phase Current, RMS Amplitude (I1)	Float IEEE754	[A]
30235	Phase Current, RMS Amplitude (I2)	Float IEEE754	[A]
30237	Phase Current, RMS Amplitude (I3)	Float IEEE754	[A]

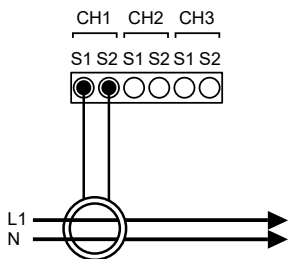
TABLE n.2 (Eg. Modbus registers writing parameters, for the complete list refer to the instrument's protocol).

HOLDING REGISTERS		
REGISTER	DESCRIPTION	TYPE
41001	RCD status: Bit 0 = CH 1 intervention Bit 1 = CH 2 intervention Bit 2 = CH 3 intervention Bit 4 = CH 1 pre-alarm Bit 5 = CH 2 pre-alarm Bit 6 = CH 3 pre-alarm	Integer
41002	RCD enabling: Bit 0 = Channel 1 (default) Bit 1 = Channel 2 Bit 2 = Channel 3	Integer
41003	RCD tripping threshold (mA)	Integer
41004	RCD tripping time (ms)	Integer
41005	RCD pre-alarm threshold (mA)	Integer
41006	RCD pre-alarm time (ms)	Integer
41007	Pre-alarm hysteresis	Integer

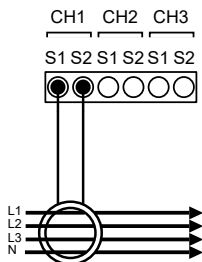
CURRENT CONNECTION

Use only the CT's provided with the instrument. Connect the CT outputs to the terminals marked I1, I2, I3 according to the applicable diagrams that follow. Each input corresponds to a differential channel.

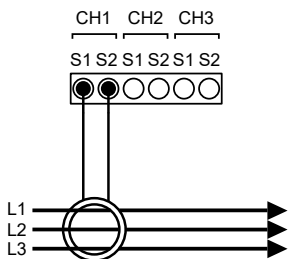
1P2W



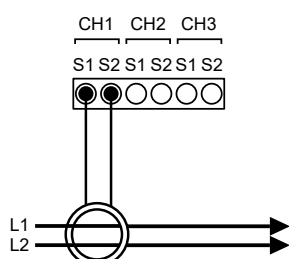
3P4W



3P3W



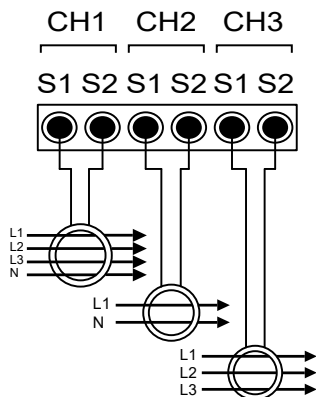
2P2W



EXAMPLE CONNECTION OF 3 DIFFERENTIAL CHANNELS

The instrument can measure up to 3 specific differential channels at the same time. Enable the corresponding RCD channels according to the wiring used.

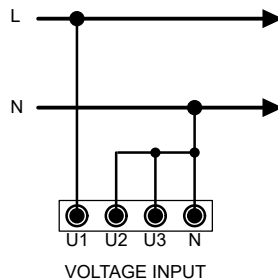
3CH



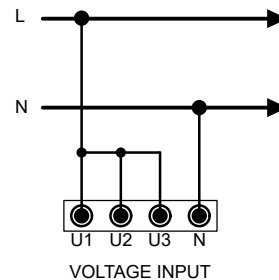
VOLTAGE CONNECTION

Use cables with max cross-section of 2,5 mm² if stranded, 4 mm² if rigid and connect them to the terminals marked VOLTAGE INPUT on the instrument according to the applicable diagrams that follow.

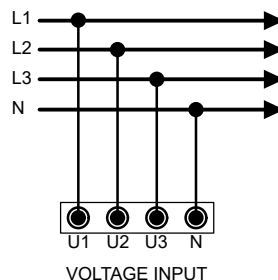
1P2W



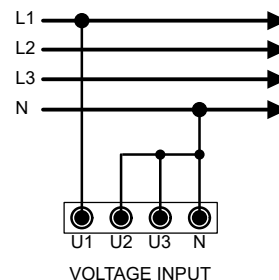
3I



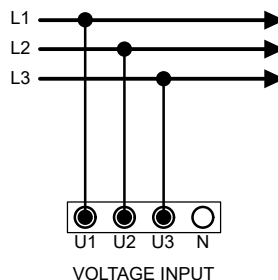
3P4W / 3P4W-B-3U / 3I



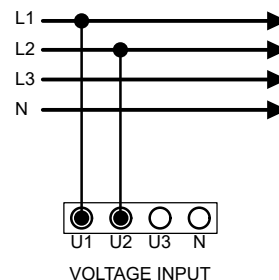
3P4W-B



3P3W / 3P3W-B-3U

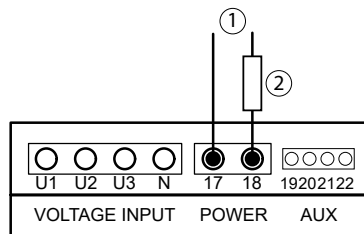


2P2W / 3P3W-B



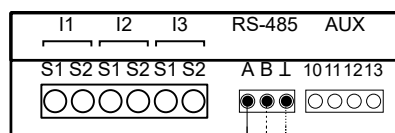
POWER SUPPLY

The instrument is equipped with a separate power supply. The power supply terminals are numbered (17) and (18). Use cables with max cross-section of 2,5 mm² if stranded, 4 mm² if rigid.



POWER SUPPLY	
1	230/240Vac +/- 10% 50/60Hz
2	F: 500 mA T

SERIAL LINE CONNECTION



RS485	
Address	27
Baud rate	38400
Parity	None
Bit of Stop	2

Max cable length: 1000 meters.

